Re-discovery of Smoky Mouse *Pseudomys fumeus* near Native Dog Flat, Alpine National Park, Victoria

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Abstract

Following the 1996 trapping of a single Smoky Mouse *Pseudomys fumeus* beside the upper reaches of the Buchan River near Native Dog Flat in the Alpine National Park, a number of attempts to record the species at the site in recent years have been unsuccessful. In November 2006, three individual Smoky Mouse were trapped in the immediate vicinity of the 1996 site. The discovery that the species still persists at the site is significant as Smoky Mouse populations are small and fragmented and there is evidence of population fluctuations and apparent local extinctions. Apart from the Grampians this is the first record of Smoky Mouse from Victoria for four years. This article describes the history of Smoky Mouse trapping and searches at Native Dog Flat and details methods and results of the successful trapping session in November 2006. (*The Victorian Naturalist* **126** (1), 2009, 13-17)

Keywords: Smoky Mouse, *Pseudomys fumeus*, Alpine National Park, Cobberas, alpine areas

Introduction

The Smoky Mouse is a small native rodent about two to three times the size of the introduced House Mouse *Mus musculus* (Fig. 1). Its fur is pale smoky grey above and whitish below. The tail is long, narrow, flexible and densely furred. The tail colour is white to pale pinkish grey underneath with a narrow dark strip along its upper surface. The ears and feet are flesh coloured with sparse white hairs (Menkhorst and Broome 2006 in prep.).

The Smoky Mouse is listed as Endangered at the national level under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. In Victoria it is listed as Threatened under the *Flora and Fauna Guarantee Act 1998* and is listed as Endangered on Schedule 1, Part 1, of the *Threatened Species Conservation Act 1995*.

The Smoky Mouse is endemic to mainland south-eastern Australia, with capture sites ranging from near sea level to at least 1800 m altitude. Within this range, populations are fragmented and generally low in number, but can fluctuate in size. There is also evidence of apparent local extinctions. The Smoky Mouse is an enigmatic species about which little is known. There is no data on which to base population estimates or to estimate trends, but some studied populations have clearly declined (Menkhorst and Broome 2006 in prep.).

The precise habitat requirements of the Smoky Mouse are far from clear. They occupy a wide range of vegetation communities, from damp coastal heath in East Gippsland, to sub-alpine heath. A characteristic of Smoky Mouse communities is their ephemeral nature, with numerous examples of unsuccessful attempts to locate the species at sites where it has been found only a few months previously (Menkhorst 2003).

History

Initial record 1996

In November 1996 a single Smoky Mouse was captured during a survey conducted in association with the Friends of the Cobberas. This individual was captured in an Elliott trap on the first and only trap night on a rock outcrop beside the Buchan River just downstream of Native Dog Flat. The location was recorded as AMG 968 147 on Map 8542 (using AGD66 datum).

Post-fire trapping 2004

Post fire trapping of historic Smoky Mouse sites in the Cobberas area (Edwards and Martin, 2004) was conducted during the period 17-21 March 2004, under funding from the Department of Sustainability and Environment and Parks Victoria, Fire Recovery Project.

Clean washed Elliott traps (Type A) were used. Grass and leaves were inserted into each trap for warmth and they were baited with a mixture of peanut butter, rolled oats and honey.

During this survey 50 Elliott traps (150 trap nights) were set along a 200 m transect extending from the south-east end of Native Dog Flat,

Fig. 1. Smoky Mouse *Pseudomys fumeus*. Left: photo by Gippsland High Country Tours. Right: photo by J Macdonald.

along the slope on the east bank of the Buchan River and concluding at the rock outcrop above the Buchan River Gorge. The latter end of the trapline encompassed the site of the 1996 Smoky Mouse capture.

No Smoky Mouse were trapped, with the only capture being a juvenile male Agile Antechinus *Antechinus agilis*.

Hair tubing 2005

In a later attempt to establish whether Smoky Mouse was present at the historic site at Native Dog Flat, the author conducted hair tubing at the site in December 2005 (Edwards 2005). Hair tubing was carried out around the rock outcrops including and surrounding the original Smoky Mouse capture site from November 1996. No Smoky Mouse hairs were collected on hair tube tapes.

Hair tubes were made from sections of PVC piping 300-350 mm long, with an internal diameter of 55 mm. At each end the pipe had been heated and depressed in a V, reducing the internal vertical diameter to approximately 40mm. The pipe was placed so the V was in the 'roof', thus increasing the chances of the tape over the V contacting the top of the animal's neck and back on entry. Double-sided adhesive tape 24 mm wide was placed around the inside of each end of the pipe. Bait (balls of peanut butter, rolled oats and honey) was secured in a metal tea infuser which was held in place by a metal peg through a central hole and the handle of the tea infuser, which also held the pipe into the ground. Prior to use, each hair tube and tea infuser was thoroughly cleaned.

The Hair Tube transect commenced at 55H 596305N 5914815E (Datum = AGD66) and 20 hair tubes were placed around various parts of the rock outcrop concluding at 55H 596895N 5914762E. Hair tubes were set on the afternoon of 12 December 2005 and were left in place for five nights. They were collected on 17 December, when each was examined on site and tapes removed. Weather conditions during the week were generally warm and mainly fine.

Seven of the 20 hair tubes had hairs adhering to tape at one or both ends and were sent to Barbara Triggs (Genoa) for analysis. Six had hairs of a Brushtail possum *Trichosurus sp.* and one had a single hair that was most likely from a cat *Felis catus* or fox *Vulpes vulpes*.

Methods for 2006 trapping

Site description

The trapping site was situated within a Special Protection Zone near Native Dog Flat in the East Alps Unit of the Alpine National Park, and encompassed the site of the 1996 Smoky Mouse capture. It was located around rock outcrops on the east bank of the Buchan River just before the stream enters steep gorge country.

No part of the site was burnt during the Alpine Fire in 2003. Some sections of the site on the slope east of the Buchan River were burnt during a fuel reduction burn in April 2001. Rock outcrops provide good shelter for small mammals, with some stumps and fallen logs providing further protection (Edwards and Martin 2004). Elevation is 1170-1185 m.

The rock outcrops did not appear to have been burnt in the April 2001 fuel reduction burn and were immediately surrounded by largely unburnt, open *Eucalyptus pauciflora* woodland. The understorey comprised *Hovea sp., Leucopogon hookeri, Leucopogon gelidus, Monotoca scoparia, Ozothamnus secundiflorus, Bossiaea foliosa, Tasmannia xerophila, Olearia megalophylla, Gaultheria appressa, Daviesia ulicifolia, Coprosma hirtella, Derwentia derwentiana, Derwentia perfoliata, Persoonia chamaepeuce, Polystichum proliferum, Asplenium flabellifolium, Poa sieberiana* var. *cyanophylla, Poa morrisii, Stellaria pungens, Celmisia* sp., *Goodenia hederacea, Craspedia aurantica* and *Stylidium* sp. One large shrub of *Podocarpus lawrencei* (3 m high) was amongst the rocks, while two smaller plants of *P. lawrencei* were found growing out of rock crevices, with more large specimens beside the river below.

The nearby slopes upstream of the rock outcrops on the east bank of the river supported an open *E. pauciflora* woodland (much of which was burnt in April 2001), on a rocky substrate with a regenerating understorey of *Oxylobium* sp., *Lomandra longifolia, Bossiaea foliosa, Poa sieberiana* var. *cyanophylla, Poa morrisii, Daviesia ulicifolia, Persoonia chamaepeuce, Derwentia derwentiana, Derwentia perfoliata, Podolepis robusta, Leucopogon* sp., *Polyscias sambucifolia, Hakea microcarpa, Olearia erubescens* and *O. myrsinoides.*

Trapping

In November 2006, 25 Elliott traps (Type A) were set around various parts of the rock outcrop in a transect between 55H 596919N 5914821E (Datum = AGD66) and 55H 596906N 5914746E. Trap placement was biased alongside rocks where crevices provided protection. A very small number of trap sites showed traces of runways beneath the vegetation against the rocks. Average distance between traps was 7 m. This transect incorporated the trapping site of the 1996 historic record, part of the 2004 trapping effort and the hair tube transect from December 2005. Traps were left in place for three nights (75 trap nights).

Clean washed traps were used, each baited with peanut butter, rolled oats and honey plus a freshly broken walnut, with Dacron placed in the trap for warmth. Each trap was inserted into a plastic cover to offer further protection from cold and rain.

Traps were checked and cleared early after sunrise, with captured animals processed and released at the point of capture. As the Smoky Mouse has been recorded to be entirely nocturnal (L Broome 2006 pers. comm. 6 November) traps were closed at the morning checking. This avoided the by-catch of non-target species during daylight hours. Traps were opened again just prior to sunset each evening.

Results of 2006 trapping

Overnight temperatures dropped from 13.6°C on the first night to 6.7°C and 3.3°C on subsequent nights. Days were fine and sunny reaching a maximum of 25.9°C at the trap site.

There were four Smoky Mouse captures (three individual animals and one re-trap) and one Bush Rat *Rattus fuscipes (*Table 1). The same trap resulted in three of the Smoky Mouse captures; the fourth was in a trap set adjacent to the successful trap.

Captured Smoky Mouse were weighed and sexed with notes made on reproductive condition. A tail measurement was taken from the first animal captured only. A small snip of guard hairs was cut on the rump of each animal as a non-permanent mark and used to identify recaptures during the trapping session.

On the first night, a female Smoky Mouse (tail length 110 mm) was captured. She was not lactating, but her rotund appearance indicated that she was probably pregnant. On the second night, the same trap captured an adult male. Due to an old injury, his tail was scarred and shortened. For the last night, an additional two traps were placed adjacent to the successful trap. The female was re-trapped in the same trap as before, while one of the additional traps captured a different male with a complete tail. Both males had longer hair than the female.

Trapping success rate for Smoky Mouse was 5.3%, with total mammal trapping results giving a trapping success rate of 6.6%.

Each male trapped exceeded the weight given for Smoky Mouse in the east of Victoria by 11 grams (Menkhorst and Knight 2001).

In common with other known Smoky Mouse locations, there was a strong presence of plants from the families Epacridaceae and Fabaceae (Table 2). On this visit, developing fruits/seeds were observed on the *Hovea* sp. and *Monotoca scoparia.*

Fig. 2. Smoky Mouse habitat near Native Dog Flat. Photo by J Macdonald.

Table 1: Summary of trapping results November 2006 (75 trap nights).

Species	Trap	Sex	Weight
Rattus fuscipes	1	Male (sub-adult)	-
Pseudomys fumeus	23	Female (pregnant?)	46 g
Pseudomys fumeus	23	Male (mature adult)	57 g
Pseudomys fumeus	23	Female Re-trap	Re-trap
Pseudomys fumeus	24	Male (mature adult)	57 g

Discussion

The re-discovery of Smoky Mouse at Native Dog Flat is very significant, being the first record at this site for ten years. Apart from the Grampians it is the first record from Victoria for four years (P Menkhorst 2006 pers. comm. 11 December). The last successful Smoky Mouse trapping in the Alpine National Park was near Mt Howitt in 2002, when nine individuals were captured (P Kambouris 2007 pers. comm. 11 April).

The capture of Smoky Mouse at this site after a ten-year interval is a rare example of site persistence by this species. Failure to detect the species during two survey efforts in the intervening years means there is no way of knowing whether Smoky Mouse have had a continued presence at this site over the ten-year period or returned after a period of absence.

All the captured animals were caught in the one trap (or an additional trap placed adjacent to it), despite the presence of the next trap in the transect only two metres away. This suggests that these animals had a very specific nest area and move only on specific runways or that this trap was at the furthest extent of their home range. The successful trap site on this occasion was approximately 15 m beyond the end of the previous survey transects.

In 2007 the author commenced a three year project studying the population dynamics of the Native Dog Flat Smoky Mouse colony and conducting searches of nearby areas in an attempt to locate further colonies.

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Table 2. Description of successful Smoky Mouse trap locations (Traps 23 and 24).

Description	Sheltered, vegetated ledge on a rock outcrop above the Buchan River Gorge.
Elevation	1170 m (map) or 1185 m (GPS)
Aspect	SSW facing rock on a west facing slope.
Rock cover	70-80% (mostly sheet rock)
Log cover	0 (over 30 cm diameter)
Fire history	Not burnt in either 2001 or 2003.
Plant species within 10m radius of traps	Dominant Species: *Hovea* sp., *Leucopogon hookeri, Leucopogon gelidus, Ozothamnus secundiflorus, Olearia megalophylla, Polystichum proliferum, Asplenium flabellifolium, Poa sieberiana* var. *cyanophylla, Poa morrisii.*
	Other species : *Eucalyptus pauciflora, Monotoca scoparia, Gaultheria appressa, Daviesia ulicifolia, Derwentia perfoliata, Celmisia* sp., *Stellaria pungens, Goodenia hederacea*
Additional plant species within 20 m radius of traps	*Bossiaea foliosa, Tasmannia xerophila, Coprosma hirtella, Podocarpus lawrencei, Stylidium* sp., *Derwentia derwentiana, Persoonia chamaepeuce, Craspedia aurantica*

conducted under the conditions of Research Permit No 10002788 issued under the Wildlife and National Parks Acts.

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One Hundred Years Ago
EXCURSION TO MELTON

To our surprise nearly all the paddocks we usually crossed were under crop, which, together with numerous barbed-wire fences, somewhat retarded our progress. Here Restless and Brown Flycatchers, Brown Tree-creepers, Pied Grallinas, Pipits, Acanthizaa, Wood-Swallows, and other birds arrested our attention. At Mr. Raleigh's farm we found Mr. Billinghurst awaiting us, and we soon made a start for the mallee scrub, passing on our way through a patch of ideal country for birds, but few were seen.

We anticipated finding many species nesting, but young Whitebrowed Pomatorhinus among the saplings, and some Pardalotes inspecting their burrows conveyed the impression that either the birds were breeding late or perhaps may not breed at all this season. Whilst enjoying our lunch the note of the Harmonious Thrush was heard, and in response to our call he came and hopped about the bushes and branches overhead, calling and whistling whilst we mimicked him. Next a brood of young Hooded Robins indulging in their first flight was observed. Yellow-faced and Yellow-tufted Honey-eaters were numerous. A Sacred Kingfisher, apparently disturbed from its nest, perched near us. But a surprise was awaiting us. On skirting the outside of some dense scrub, a Black-eared Cuckoo, *Misocalius palliolatus,* Lath., was seen hopping about a small dry tree. It was shot, and proved to be a female. In its oviduct was an egg complete all but the shell, and there were a number of other large yolks. The inference to be drawn from this is that, although it is usual to find only one cuckoo-egg in the nest of the foster-parent, the same cuckoo may lay in a number of different nests. ... Nice specimens of the fern *Grammitis rutifolia* were found growing in some rock crevices, and a specimen of the little yellow butterfly, *Terias smilax,* was observed. Early in the day a few specimens of the orchid *Pterostylis mutica* were found not far from the station, but just past their best. Though in better condition than on the occasion of our visit twelve months before, the country was still suffering from the succession of dry seasons, which probably accounts for the scarcity of birds, &c.—G. A. KEARTLAND.

The Victorian Naturalist **XXV**, p. 141, January 1909